

# BMJ Open Evaluating online information on temporomandibular disorders: readability, reliability, content and quality: a scoping review protocol

Carolina Venda Nova <sup>1,2</sup>, Jessica Silva,<sup>1</sup> Natacha Faustino,<sup>3</sup> Juan Nicolás Cuenca-Zaldívar,<sup>4,5,6,7</sup> Nina Cadeau Comte,<sup>5,8</sup> Rob Sillevs,<sup>9</sup> Eleuterio A Sánchez Romero <sup>4,5,9,10</sup>, André Mariz de Almeida<sup>3</sup>

**To cite:** Venda Nova C, Silva J, Faustino N, *et al*. Evaluating online information on temporomandibular disorders: readability, reliability, content and quality: a scoping review protocol. *BMJ Open* 2025;**15**:e106870. doi:10.1136/bmjopen-2025-106870

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<https://doi.org/10.1136/bmjopen-2025-106870>).

Received 22 June 2025  
Accepted 30 September 2025



© Author(s) (or their employer(s)) 2025. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ Group.

For numbered affiliations see end of article.

## Correspondence to

Dr Eleuterio A Sánchez Romero; [esanchezromero@fgcu.edu](mailto:esanchezromero@fgcu.edu),  
Dr Juan Nicolás Cuenca-Zaldívar;  
[nicolas.cuenca@salud.madrid.org](mailto:nicolas.cuenca@salud.madrid.org),  
Dr Rob Sillevs;  
[rsillevis@fgcu.edu](mailto:rsillevis@fgcu.edu) and  
Professor Nina Cadeau Comte;  
[nina.c@etik.com](mailto:nina.c@etik.com)

## ABSTRACT

**Introduction** Temporomandibular disorders (TMDs) are a prevalent group of musculoskeletal conditions affecting the temporomandibular joint, associated structures and masticatory muscles. The internet has become a primary source of health information for many patients; however, the readability, reliability, content and quality of online information on TMDs vary widely. A comprehensive synthesis of the characteristics and evaluation methods of such content is currently lacking.

**Methods and analysis** This scoping review will follow the Joanna Briggs Institute methodology and be reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews checklist. Peer-reviewed primary and secondary studies assessing online information on TMDs will be included if they report on readability, reliability, content or quality. Eligible information sources include publicly available websites, videos and social media; discussion forums and printed materials will be excluded. No language, date or geographical restrictions will be applied. A three-step search strategy will be implemented across PubMed, Web of Science, Embase, PsycINFO and CINAHL, followed by citation tracking. Screening will be conducted independently by two reviewers using Rayyan. Data will be extracted with a pilot-tested charting tool and synthesised narratively and descriptively in tabular and graphical formats.

**Ethics and dissemination** As this study will only use data from publicly available sources, ethical approval is not required. Findings will be disseminated through publication in a peer-reviewed journal, conference presentations and professional networks, with the aim of guiding the development of accessible and reliable digital resources for individuals seeking information on TMDs.

**Registration** This protocol has been prospectively registered on the Open Science Framework (OSF): <https://doi.org/10.17605/OSF.IO/TAH7K>.

## INTRODUCTION

Temporomandibular disorders (TMDs) are defined by the International Classification of Orofacial Pain as ‘pain localised to the temporomandibular joint (TMJ), occurring

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This protocol will follow the Joanna Briggs Institute methodology for scoping reviews and will comply with Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines, ensuring methodological rigour and transparency.
- ⇒ A comprehensive, multidatabase search strategy will be developed, peer reviewed and applied without language or date restrictions, enhancing the inclusiveness of the review.
- ⇒ The data extraction form will be piloted and designed to capture multiple domains of online information (content, readability, quality and reliability).
- ⇒ However, this study will not include grey literature or user-generated content, such as forums and blogs, and no formal quality appraisal of the included studies will be performed, which may limit interpretation.
- ⇒ Given the rapidly evolving nature of the digital environment, some of the online health information identified may become outdated quickly, potentially affecting the long-term applicability of the results.

at rest or during jaw movement or palpation, with no known causative disorder’.<sup>1</sup> These disorders are among the most frequent non-odontogenic causes of orofacial pain, affecting the TMJ, masticatory muscles and surrounding structures.<sup>2</sup> TMD can manifest as acute or chronic pain, restricted jaw movement and joint sounds, such as clicking or crepitus. Although they may occur at any age, TMDs are most prevalent in individuals aged 20–40 years and disproportionately affect women.<sup>3</sup> With a general population prevalence of approximately 10%–15%,<sup>4</sup> TMDs are among the most common chronic pain conditions, alongside low back pain and headaches.<sup>2</sup>

The aetiology of TMD is multifactorial, involving complex interactions among



biological, psychological and social factors. Established pathophysiological contributors include central and peripheral sensitisation, sex, pain catastrophising, stress, depression and adverse childhood events.<sup>5</sup> TMDs are frequently comorbid with other chronic conditions, such as fibromyalgia, migraine and sleep disorders.<sup>5</sup> When pain persists for more than 3 months, TMD may evolve into a chronic condition with a substantial impact on the function and quality of life.<sup>6</sup>

Management of TMD is multidisciplinary, encompassing medical approaches, physiotherapy, behavioural interventions, use of occlusal splints in arthrogenous cases and occasionally surgery.<sup>3</sup> Supported self-management and shared decision-making are increasingly being recognised as essential components of care.<sup>7</sup> Consequently, patient health literacy, particularly regarding digital sources of information, plays a vital role in enabling individuals to understand their condition and make informed decisions.<sup>8</sup>

Despite increasing reliance on online platforms to seek health information, prior studies have shown that internet-based content on TMDs varies significantly in clarity, accuracy and quality.<sup>9</sup> Misinformation and outdated content can mislead patients, delay diagnosis and contribute to suboptimal adherence to treatment. Therefore, healthcare professionals and researchers must critically assess the nature of digital TMD resources and support the development of accessible evidence-based educational materials. Recent studies have explored specific aspects of this topic—for example, the systematic review by Mehta *et al.*<sup>10</sup> focusing on social media platforms, and content analyses of YouTube videos by Arikan and Erol<sup>11</sup> and Tok *et al.*<sup>12</sup> However, to our knowledge, no scoping review has yet synthesised peer-reviewed studies that evaluate online TMD-related content across different platforms, assessment dimensions (eg, readability, reliability, quality and content) and methodological tools. Our review addresses this gap by mapping the characteristics and methods used to evaluate such digital resources in the published literature.

Given the heterogeneity of sources (websites, videos and social media) and the need for an overview of the current informational landscape, a scoping review is the most suitable approach. Scoping reviews are particularly suitable for mapping the breadth and nature of available evidence, especially when addressing heterogeneous sources, diverse methodologies or emerging research areas, as is the case with online information related to TMDs. This protocol was developed prospectively, in accordance with PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) recommendations for transparent reporting of systematic review protocols,<sup>13</sup> and follows the methodological guidance of the Joanna Briggs Institute (JBI)<sup>14</sup> and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.<sup>15</sup> The resulting review will provide a comprehensive synthesis of peer-reviewed studies assessing online information

about TMD, focusing on four key domains: readability, reliability, content and quality.

## OBJECTIVES

This scoping review aims to map and synthesise the existing peer-reviewed literature on the readability, reliability, content and quality of online health information concerning TMDs. Specifically, the review seeks to address the following questions.

1. What are the main characteristics of online health information sources (eg, websites, videos and social media content) related to TMDs?
2. What assessment tools or criteria have been used to evaluate the readability, reliability, quality or content of this information?
3. What is the reported level of readability, reliability, quality and content accuracy of the available online information on TMDs?
4. What gaps exist in the current literature regarding the evaluation of digital information on TMDs?

This review uses the population–concept–context (PCC) framework, defined as follows.

- Population: individuals seeking information on TMDs.
- Concept: evaluation of online information in terms of readability, reliability, content and quality.
- Context: online platforms, including websites, digital videos and social media.

## METHODS

### Protocol and registration

This protocol was developed in accordance with the JBI Manual for Evidence Synthesis,<sup>14</sup> follows the PRISMA-P recommendations for protocol reporting<sup>13</sup> and aligns with the best practice guidance for scoping review protocols outlined by Peters *et al.*<sup>16</sup> The reporting of the protocol complies with the PRISMA-ScR checklist.<sup>15</sup> The study is planned to start in August 2025 and be completed by February 2026.

The protocol has been prospectively registered on the *Open Science Framework (OSF)* and is publicly accessible at <https://doi.org/10.17605/OSF.IO/TAH7K>.

### Eligibility criteria

The eligibility criteria for this scoping review were developed using the *PCC* framework recommended by the JBI.

#### ► Population

This review considers studies that examine or report information intended for individuals seeking to understand or manage *TMDs*. The population is not restricted to specific age groups, health conditions or clinical settings, as the focus is on the content provided rather than on the participants themselves.

► **Concept**

The central concept of this review is the *evaluation of online information* related to TMDs in terms of *readability, reliability, content* and *quality*. Studies that have applied established instruments, such as *DISCERN*, *JAMA benchmark criteria*, *Health on the Net (HONcode)* or *EQIP (Ensuring Quality Information for Patients)*, among others, will be considered eligible. Quantitative and qualitative assessments were performed.

► **Context**

The context includes *online environments* where health information is published or disseminated, such as websites, digital videos (eg, YouTube), institutional health portals or social media platforms. Studies that focused on online forums, blogs or discussion boards without structured health information were excluded. Patient information leaflets or printed brochures were also excluded.

► **Types of sources**

This review will include *peer-reviewed primary and secondary research studies*. Eligible study designs included observational studies, content analyses, cross-sectional studies and reviews that systematically assessed or summarised online information related to TMDs. Editorials, commentaries, conference abstracts and opinion articles were excluded. To ensure that the findings reflect the current digital health environment, only studies published within the last 10 years (from January 2015 onward) will be considered for inclusion.

### Information sources and search strategy

A comprehensive three-step search strategy was employed in accordance with the JBI methodology for scoping reviews.<sup>11</sup>

1. Initial limited search

An initial exploratory search was conducted in *PubMed* to identify relevant keywords and Medical Subject Headings (MeSH) related to TMDs and online health information. This has led to the development of a more refined search strategy.

2. Comprehensive database search

The final search strategy will be adapted and implemented across the following electronic databases.

- PubMed.
- Web of Science.
- Embase.
- PsycINFO.
- CINAHL.

The search strategy combines controlled vocabulary (eg, MeSH terms) and free-text terms related to:

- temporomandibular disorders (TMDs and TMJ);
- online health information (websites, videos and social media)
- evaluation criteria (readability, reliability, content and quality).

No date or language restrictions were imposed. The full search strategy for PubMed is provided in online

supplemental Appendix I. Equivalent strategies will be adapted for Embase, Web of Science, PsycINFO and CINAHL, respecting the controlled vocabulary and syntax specific to each database.

3. Handsearching and citation tracking

The reference lists of all included studies were manually screened to identify additional relevant studies that were not retrieved in the initial database searches. If the full text of any potentially eligible article could not be accessed, the corresponding author was contacted.

### Selection of sources of evidence

All records identified through the database searches were imported into *EndNote* for deduplication. The resulting unique records are then uploaded to Rayaan, an AI-powered online platform designed to facilitate systematic screening, accelerate reviewer decisions and support blinded conflict resolution during the selection process.

The selection process will be conducted in three phases.

1. Pilot testing

Prior to the main screening, two independent reviewers will pilot test a random sample of ten studies to assess the consistency of the eligibility criteria and validate the screening tool. Discrepancies will be resolved through discussion or, if needed, by involving a third reviewer. An agreement threshold of  $\geq 80\%$  will be required before proceeding with the full screening.

2. Title and abstract screening

Two independent reviewers will screen the titles and abstracts of all retrieved records based on the predefined eligibility criteria. Studies deemed irrelevant by both the reviewers were excluded. Discrepancies will be resolved through discussion or consultation with a third reviewer if needed.

3. Full-text screening

Articles retained after abstract screening will undergo full-text review by two independent reviewers to determine the final inclusion. The reasons for exclusion at this stage will be documented and reported in the *PRISMA-ScR flow diagram*.

Any disagreements during the screening process were resolved through consensus or by involving a third reviewer when necessary.

### Data extraction (data-charting process)

Data from the included studies will be extracted using a standardised data-charting form developed by the review team. This form was designed based on the relevant literature and tailored to capture the key elements related to the objectives of this review. The draft form is provided in online supplemental Appendix II and will be piloted on a subset of studies (n=5) to ensure consistency and relevance.

The following data items will be extracted from each included source of evidence.

- Author(s) and year of publication
- Country in which the study was conducted
- Study design

- ▶ Type and number of information sources assessed
- ▶ Type of online information (eg, websites, videos and social media)
- ▶ Instruments used to evaluate:
  - *readability* (eg, Flesch–Kincaid and Simple Measure of Gobbledygook);
  - *content*
  - *quality* (eg, JAMA and EQIP)
  - *reliability* (eg, DISCERN and HONcode).

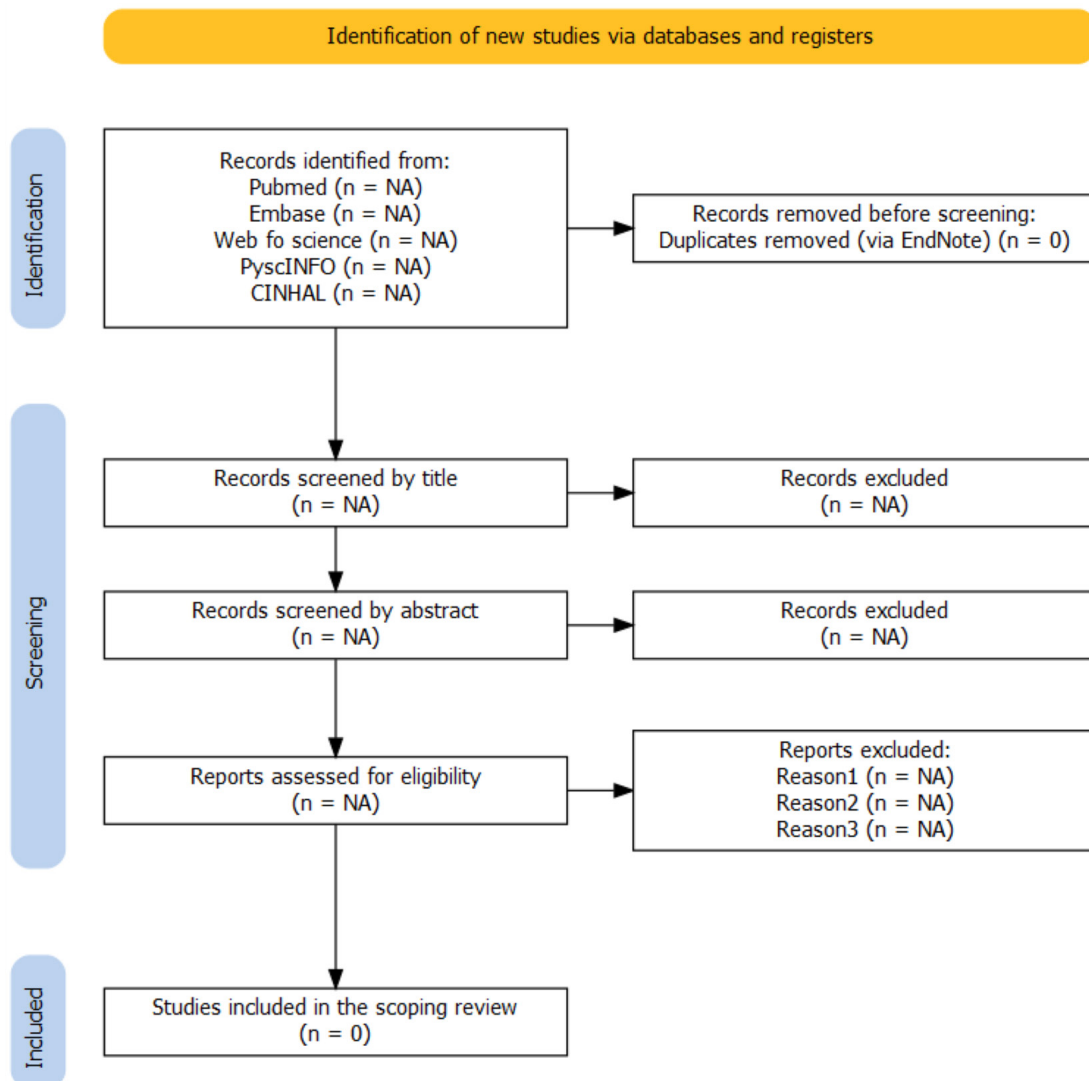
Data extraction will be performed independently by two reviewers. Disagreements will be resolved through discussion or adjudication by a third reviewer. If necessary, the authors of the primary studies will be contacted for clarification or for missing data.

The data-charting form may be iteratively refined during the extraction process to capture relevant emerging variables. The data-charting form will be piloted by two reviewers and refined iteratively. The list of data items to be extracted is presented in online supplemental Appendix II (Table 1).

### Data analysis and presentation of results

Data will be analysed and synthesised using *descriptive quantitative and qualitative approaches* in alignment with JBI guidance for scoping reviews.<sup>11</sup> Quantitative data (eg, frequency of tools used, publication years and countries of origin) will be summarised using descriptive statistics, such as counts, percentages, means and SD where applicable. Where feasible, subgroup comparisons (eg, clinician- vs patient-generated content or different online platforms) will be explored descriptively to identify potential patterns or differences.

Qualitative data, including narrative descriptions of information quality or reliability, will be synthesised using a *narrative approach* to identify patterns, gaps and conceptual categories across studies. The results will be presented in *tabular and graphical formats*, including summary tables and visual maps, where appropriate:



**Figure 1** Anticipated study selection flow diagram (PRISMA-ScR framework). PRISMA-ScR, Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews.

- ▶ the distribution of studies by year and country;
- ▶ the types of digital media evaluated;
- ▶ the frequency and type of assessment tools applied;
- ▶ main findings regarding the readability, content, quality and reliability of online TMD information.

The synthesis will remain descriptive in nature, without performing a critical appraisal or meta-analysis, in accordance with the scoping review methodology. The anticipated study selection process is depicted in [figure 1](#) (PRISMA-ScR flow diagram).

### Patient and public involvement

None.

### Ethics and dissemination

As this scoping review will only involve the analysis of data from publicly available published literature, *ethical approval is not required*.

The review findings will be disseminated through publication in a peer-reviewed journal, presentations at national and international conferences and shared with professional and academic networks. Additionally, the results will be made accessible to healthcare professionals and educators involved in the management of TMDs, with the aim of informing the development of clearer, more reliable and patient-centred online health information.

### STRENGTHS AND LIMITATIONS OF THE STUDY

This scoping review will have several strengths. First, it will follow a rigorous methodological framework established by the *JBI*, ensuring transparency, reproducibility and comprehensiveness in identifying and synthesising available evidence. Second, the absence of language restrictions allows for the inclusion of a wide range of relevant studies across different contexts. However, only studies published in the last 10 years will be considered, to ensure that the findings reflect the current landscape of digital health information. Third, the use of multiple established tools to assess the readability, reliability, content and quality of online information (eg, DISCERN, JAMA criteria, EQIP and HON code) will facilitate a multidimensional analysis of the digital landscape regarding TMDs.

However, this study has some limitations. The review will not include grey literature or user-generated content, such as discussion forums and blogs, which may contain relevant insights into real-world information-seeking behaviour. In addition, although this review will chart the instruments used to assess online content, it will not appraise the methodological quality or risk of bias of the included studies in accordance with the scoping review design. Finally, as the digital environment evolves rapidly, some findings may quickly become outdated, which highlights the need for ongoing evaluation of online health information.

The results of this scoping review will help identify strengths, gaps and limitations in the current body of evidence assessing online information related to TMDs. These insights are intended to guide future research, support the development of more effective patient education strategies and contribute to improving the quality and accessibility of digital health communication on TMD.

### Author affiliations

<sup>1</sup>RISE-Health, Faculty of Health Sciences, Fernando Pessoa University, Porto, Portugal

<sup>2</sup>University College Cork, Cork, Ireland

<sup>3</sup>Egas Moniz School of Health and Science, Caparica, Portugal

<sup>4</sup>Research Group in Nursing and Health Care, Puerta de Hierro Health Research Institute-Segovia de Arana (IDIPHISA), Madrid, Spain

<sup>5</sup>Interdisciplinary Research Group on Musculoskeletal Disorders, Madrid, Spain

<sup>6</sup>Primary Health Center “El Abajón”, Madrid, Spain

<sup>7</sup>Foundation for Biosanitary Research and Innovation in Primary Care (FIIBAP), Madrid, Spain

<sup>8</sup>Universite Toulouse-Jean Jaures, Toulouse, France

<sup>9</sup>Department of Rehabilitation Sciences, Florida Gulf Coast University, Fort Myers, Florida, USA

<sup>10</sup>Physiotherapy and Orofacial Pain Working Group, Sociedad Española de Disfunción Craniomandibular y Dolor Orofacial (SEDCYDO), Madrid, Spain

**Contributors** CVN, AMdA, ESR and JNC-Z conceived the review, prepared the protocol and coordinated the manuscript development. JS and NF conducted preliminary searches and contributed to drafting the Methods section. NCC contributed to refining the background and contextual framework. RS provided methodological input and critical review of the manuscript. All authors reviewed and approved the final version. AMdA is the guarantor of this review.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** This work was conducted without direct external funding. The authors are affiliated with Florida Gulf Coast University and the Puerta de Hierro Health Research Institute—Segovia de Arana, which provided academic and institutional support. All other authors have no competing interests to declare.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

### ORCID iDs

Carolina Venda Nova <https://orcid.org/0000-0002-4007-7083>

Eleuterio A Sánchez Romero <https://orcid.org/0000-0003-0254-6501>

### REFERENCES

- 1 ICOP. International Classification of Orofacial Pain, 1st edition (ICOP). *Cephalalgia* 2020;40:129–221.



- 2 Patel K, Eley KA, Cascarini L, *et al.* Temporomandibular disorders—review of evidence-based management and a proposed multidisciplinary care pathway. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2023;136:54–69.
- 3 Beecroft E, Julia P, Penlington C, *et al.* 85. Management of painful temporomandibular disorder in adults. NHS England getting it right first time (GIRFT) and royal college of surgeons' faculty of dental surgery. 2024. Available: <https://www.rcseng.ac.uk/dental-faculties/fds/publications-guidelines/clinical-guidelines/>
- 4 Beecroft E, Penlington C, Desai H, *et al.* Temporomandibular Disorder for the General Dental Practitioner. *Prim Dent J* 2019;7:62–70.
- 5 Benoliel R, Svensson P, Heir GM, *et al.* Persistent orofacial muscle pain. *Oral Dis* 2011;17 Suppl 1:23–41.
- 6 Slade GD, Ohrbach R, Greenspan JD, *et al.* Painful Temporomandibular Disorder: Decade of Discovery from OPPERA Studies. *J Dent Res* 2016;95:1084–92.
- 7 Palmer J, Penlington C, Durham J. Supported self-management in temporomandibular disorders: A systematic review of behavioural components. *Oral Surg* 2023;16:228–36.
- 8 Kang J-H. Influences of decision preferences and health literacy on temporomandibular disorder treatment outcome. *BMC Oral Health* 2022;22:385.
- 9 Park MW, Jo JH, Park JW. Quality and content of internet-based information on temporomandibular disorders. *J Orofac Pain* 2012;26:296–306.
- 10 Mehta V, Negi S, Jagtap SR, *et al.* Quality, reliability, and content on social media about temporomandibular joint disorders: A systematic review. *Cranio* 2025;Apr 21:1–11.
- 11 Arikan H, Erol E. Quality and reliability evaluation of YouTube exercises content for temporomandibular disorders. *BMC Oral Health* 2025;25:301.
- 12 Tok ÖN, Yurttaş AN, Taş S. YouTube videos as an information source about exercises for temporomandibular disorders. *Dent Med Probl* 2024;61:855–63.
- 13 Moher D, Stewart L, Shekelle P. Implementing PRISMA-P: recommendations for prospective authors. *Syst Rev* 2016;5:15.
- 14 Aromataris E, Lockwood C, Porritt K, *et al.* *JBI manual for evidence synthesis*. 2024. Available: <https://synthesismanual.jbi.global>
- 15 Tricco AC, Lillie E, Zarin W, *et al.* PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018;169:467–73.
- 16 Peters MDJ, Marnie C, Tricco AC, *et al.* Updated methodological guidance for the conduct of scoping reviews. *JBI Evid Synth* 2020;18:2119–26.